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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/437,489	11/10/1999	HIROHIKO ISHII	99224	8040

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EXAMINER

KIM, DAVID S

ART UNIT	PAPER NUMBER
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2633

DATE MAILED: 03/22/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/437,489

Applicant(s)

ISHII, HIROHIKO

Examiner

David S. Kim

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 06 February 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-3,5 and 6 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3,5 and 6 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

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## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. **Claims 1 and 5-6** are rejected under 35 U.S.C. 103(a) as being unpatentable over Rosenberg (U.S. Patent No. 5,506,445) in view of Yamana et al. (U.S. Patent No. 5,418,384) and Ito et al. (U.S. Patent No. 5,130,531). Rosenberg discloses an IR communication device comprising:

a substrate having a longitudinal X-direction and a lateral Y-direction;

an infrared rays receiving element mounted on the substrate at a position in the X-direction;

a first lens provided on an infrared rays emitting element; and

a semispherical second lens provided on the infrared rays receiving element;

(Rosenberg, col. 2, lines 50-57, Figs. 3a-3d).

Rosenberg does not expressly disclose:

a plurality of infrared rays emitting elements mounted on the substrate and arranged in the X-direction;

the first lens elongated in the X-direction;

the first lens having an elongated convex shape having two convex opposing end portions, and having a length longer than a length of the arrangement of the infrared rays emitting elements,

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a sectional shape of the first lens in the X-direction and position of each of the infrared rays emitting elements with respect to the sectional shape of the first lens being selected, so that infrared rays radiation range is expanded in the X-direction over the two convex opposing end portions of first lens;

wherein the first lens and the second lens being formed into an integral one-piece lens and secured to the substrate.

However, Yamana et al. discloses such a plurality of elements (Yamana et al., light-emitting diode chips 2 in Fig. 1, col. 3, lines 1-2) and first lens (Yamana et al., col. 3, lines 21-36, Fig. 2) having two convex opposing end portions (Yamana et al., convex opposing end portions of cylindrical lens 4 in Fig. 1), and having a length longer than a length of the arrangement of the infrared rays emitting elements, a sectional shape of the first lens in the X-direction and position of each of the infrared rays emitting elements with respect to the sectional shape of the first lens being selected, so that infrared rays radiation range is expanded in the X-direction. At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to incorporate the plurality of elements and first lens of Yamana et al. in the device of Rosenberg. One of ordinary skill in the art would have been motivated to do this since "light rays which have passed through that surface [lens] portion are collected more closely along the optical axis of the lens" (Yamana et al., col. 4, lines 3-5, Figs. 2 and 8). This increased collection of light rays along the optical axis of the lens enables one to focus the light rays in a particular direction with less scatter toward peripheral directions. Additionally, the plurality of elements of Yamana et al. would increase the light intensity of the light-emitting portion of Rosenberg. Such an increase in light intensity would also increase the transmission range of the device of Rosenberg.

Rosenberg in view of Yamana et al. does not expressly disclose:

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the infrared rays radiation range being expanded over the two convex opposing end portions of first lens.

However, one of ordinary skill in the art would notice that infrared rays (from the plurality of infrared rays emitting elements) incident at the first lens surface of Rosenberg in view of Yamana et al. would inherently refract. In particular, some infrared rays would refract over the two convex opposing end portions of X-line of first lens, inherently expanding infrared rays radiation range in the X-direction over the two convex opposing end portions of first lens.

Rosenberg in view of Yamana et al. still does not expressly disclose:

wherein the first lens and the second lens being formed into an integral one-piece lens and secured to the substrate.

Ito et al. teaches a communication device wherein a first lens and a second lens are formed in an integral one-piece lens and secured to a substrate (Ito et al., Figs. 5-7 and 16-21, col. 2, lines 34-64, col. 8, line 23-51). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to modify the lenses of Rosenberg in view of Yamana et al. to incorporate this lens teaching of Ito et al. One of ordinary skill in the art would have been motivated to do this to minimize the number of parts and assembly steps (Ito et al., col. 2, lines 59-62).

**Regarding claim 5,** Rosenberg in view of Yamana et al. and Ito et al. discloses:

The infrared communication device according to claim 1 wherein the first lens is elongated in a horizontal direction (Yamana et al., Fig. 1)

**Regarding claim 6,** Rosenberg in view of Yamana et al. and Ito et al. does not expressly disclose:

The infrared communication device according to claim 1 further comprises a reflective cup enclosing the first lens.

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However, Yamana et al. further teaches a lens having an elongated convex shape provided on a light-emitting element (see treatment of claim 1 above) and a reflective cup enclosing said lens (see Figs. 1-3 and the corresponding descriptions in col. 2, lines 55-60; col. 3, lines 10-20). At the time of the invention was made, it would have been obvious to a person of ordinary skill in the art to incorporate a reflective cup enclosing the lens of Rosenberg in view of Yamana et al. and Ito et al., as taught by Yamana et al. One of ordinary skill in that art would have been motivated to do this since "light rays emitted sidewardly of the chip are reflected frontwardly by a convex mirror [cup] formed on the substrate integrally therewith. Therefore, light rays incident on the cylindrical lens within an effective range will increase, it being thus possible to achieve improved utilization of light" (Yamana et al., col. 4, lines 27-33).

3. **Claim 2** is rejected under 35 U.S.C. 103(a) as being unpatentable over Rosenberg in view of Yamana et al. and Ito et al. as applied to claim 1 above, and further in view of Amano. Rosenberg in view of Yamana et al. and Ito et al. discloses all the limitations of claim 2 except for said first lens having a semi-cylindrical shape. However, Amano teaches such a lens having a semi-cylindrical shape (see Figs. 9). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to use the semi-cylindrical shape of Amano for the lens of Rosenberg in view of Yamana et al. and Ito et al. One of ordinary skill in the art would have been motivated to do this since "light rays which have passed through that surface [lens] portion are collected more closely along the optical axis of the lens" (Yamana et al., col. 4, lines 3-5, Figs. 2 and 8). This increased collection of light rays along the optical axis of the lens enables one to focus the light rays in a particular direction with less scatter toward peripheral directions.

4. **Claim 3** is rejected under 35 U.S.C. 103(a) as being unpatentable over Rosenberg in view of Yamana et al. and Ito et al. as applied to claim 1 above, and further in view of Fujimura et al. Rosenberg in view of Yamana et al. and Ito et al. discloses all the limitations of claim 3

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except for said first lens having an elongated semi-spherical shape. However, Fujimura et al. teaches such a lens having an elongated semi-spherical shape (see Drawings 1-3 and section "Detailed Description," items 0011 and 0014-0016). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to use the elongated semi-spherical shape of Fujimura et al. for the lens of Rosenberg in view of Yamana et al. and Ito et al. One of ordinary skill in the art would have been motivated to do this since "light rays which have passed through that surface [lens] portion are collected more closely along the optical axis of the lens" (Yamana et al., col. 4, lines 3-5, Figs. 2 and 8). This increased collection of light rays along the optical axis of the lens enables one to focus the light rays in a particular direction with less scatter toward peripheral directions.

### **Response to Arguments**

5. Applicant's arguments with respect to the newly amended claims have been considered but are moot in view of the new ground(s) of rejection. In particular, the present version of the claims includes the newly introduced limitation of "the first lens and the second lens being formed into an integral one-piece lens and secured to the substrate" (Paper No. 19, p. 2, claim 1). In response to this amendment, Ito et al. is applied (see treatment of claim 1 above).

### **Conclusion**

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Tanaka et al. is cited to show related lens teachings of forming two lenses into an integral one-piece lens that is secured to a substrate.

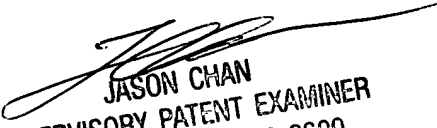
Any inquiry concerning this communication or earlier communications from the examiner should be directed to David S. Kim whose telephone number is 703-305-6457. The examiner can normally be reached on Mon.-Fri. 9 AM to 5 PM (EST).

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on 703-305-4729. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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